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NEW DIPTERA FROM NORTH AND CENTRAL AMERICA

By C. H. Curran

The following pages contain descriptions of new flies from North and Central America. The types of the new species are in The American Museum of Natural History.

Bombyliidæ

In the genus, *Exoprosopa* Macquart is a species group characterized by having the anterior margin of the wing brown and without hyaline indentations. In this group the base of the wing is brown and beyond this the brown pattern variable in width but almost always reaching to beyond the end of the subcostal vein, decreasing in width apically. This group has received very little attention from students of the family and identifications have always been of a tentative nature. The species first described have evidently not been found in numbers since the descriptions appeared, but several related froms have been identified under the existing names, two or more species often appearing above a single label.

During 1916 and 1920, Dr. F. E. Lutz collected a large number of specimens of *Exoprosopa* in Texas, Arizona, and Colorado, many of them falling into the group which I have designated as II for convenience. These form the basis of the present paper, but in order to correct some erroneous synonymy and to simplify the identification of species in the genus I have prepared keys to each of the groups. Of Group I we have no specimens; of Group II most of the species are represented and only the species related to *fasciata* are omitted from the key; in Group III only the species in the collection are included, the recently described forms being very difficult to identify and from the descriptions it is impossible to place them in a key.

In Group II the first seven specimens appearing in the key actually belong to a genus other than *Exoprosopa*, being characterized by a long, projecting proboscis and the presence of spicules or small bristles on the anterior tibiæ; the remaining species including Groups I and III belong together, unless the petiolate first posterior cell shou d be con-

sidered of generic value. However, the American Bombyliidæ are so badly in need of a thorough generic and specific revision that it seems wisest at the present time to leave the species under the one generic name, hence no attempt is made here to segregate the species into the genera recognized in the Old World.

KEY TO GROUPS OF *Exoprosopa*

1. Wings with fasciate markings.....Group III.
   Wings hyaline or brown in front, the cross-veins sometimes clouded.....2.
2. Wings brown in front or almost evenly pale brownish.....Group II.
   Wings hyaline.....Group I.

GROUP I

1. First posterior cell closed and long petiolate.....*tiburonensis* Cole.
   First posterior cell open.....2.
2. Style not longer than the width of the segment.....*hyalipennis* Cole.
   Style two-thirds as long as third antennal segment.....*atripes* Cole.

GROUP II

1. First posterior cell open.....2.
   First posterior cell long petiolate at the apex.....21.
2. Proboscis projecting beyond the oral opening for a distance much greater than the length of the labellæ.....3.
   At most the labellæ projecting beyond the oral margin.....9.
3. Antennal style as long as or longer than the third antennal segment.....6.
   Antennal style not over three-fourths as long as the third antennal segment..4.
4. The proboscis projects distinctly less than the length of the head beyond the oral margin, the suture at base of labellæ before the middle of the projecting section.....5.
   The proboscis projects more than the length of the head beyond the oral margin, the suture well beyond the middle of the projecting section..*clarki*, n. sp.
5. No trace of brown cloud at base of third posterior cell....*dodrans* Osten Sacken.
   A faint cloud at base of third posterior cell.....*filia* Osten Sacken.
6. Style twice as long as third antennal segment.....*socia* Osten Sacken.
   Style not nearly twice as long as third segment.....7.
7. A distinct brown cloud at base of fourth posterior cell.....8.
   Scarcely a trace of brown cloud at base of fourth posterior cell...*lutzi*, n. sp.
8. Face reddish in ground color at least on the lower half.....*dodrina*, n. sp.
   Face blackish except the narrow oral margin.....*rostrifera* Jænnicke.
9. Either the vein at the base of the second posterior cell or the cross-vein separating the second and third submarginal cell clouded with brown.....10.
   Both these veins unclouded or all the veins clouded.....13.
10. Second basal cell hyaline or tinged with brown, its base a little brownish....11.
    Second basal cell brown not contrasting with the brown area..*pavida* Williston.
11. Second basal cell distinctly tinged with brown.....*agassizii* Loew.
    Second basal cell almost hyaline.....12.
12. Intermediate abdominal segments with broad yellow or white cross-bands on basal half (*brevistylatus* Williston).....*pardus* Osten Sacken.

Intermediate segments black basally, paler apically.....*sackeni* Williston.
13. All the veins clouded with brownish or luteous.....*fasciata* Macquart.
Longitudinal veins not wholly clouded.....14.
14. Second basal cell almost wholly brown.....18.
Second basal cell almost wholly sub-hyaline.....15.
15. Antennal style much longer than width of third antennal segment.....16.
Antennal style not longer than width of third antennal segment..*texana*, n. sp.
16. Vein at base of fourth posterior cell distinctly clouded.....17.
Vein at base of fourth posterior cell not at all clouded.....*bifurca* Loew.
17. Mesonotum with coarse yellow hair in front of the scutellum.
titubans Osten Sacken.
Mesonotum with coarse black hair in front of the scutellum....*mus*, n. sp.
18. Face black in ground color.....19.
Face reddish in ground color.....20.
19. A large area of silvery white scales between and above the antennæ.
albifrons, n. sp.
Black and yellow scales in this region.....*panamensis*, n. sp.
20. Face and front destitute of black scales.....*junta*, n. sp.
Face and front with black scales in the middle.....*brevirostris* Williston.
21. Wings hyaline, the costal and subcostal cells yellowish.....*tiburonensis* Cole.
Wings brownish, paler posteriorly.....*limbipennis* Macquart.

GROUP III

1. Anal cell crossed by a hyaline band on basal half.....4.
Anal cell brown on basal half.....2.
2. Dilated portion of marginal cell wholly brown.....*decora* Loew.
Dilated portion of marginal cell partly or wholly hyaline.....3.
3. Marginal cell wholly hyaline apically.....*emarginata* Macquart.
Marginal cell brown at the apex.....*lacera* Wiedemann.
4. Apical part of marginal cell wholly hyaline.....8.
Apical part of marginal cell partly or wholly brown.....5.
5. The long hair on the upper part of the pleura is wholly yellow or whitish....6.
The long hair is largely black.....7.
6. The hyaline spot in the marginal cell lies well before the bulbous part.
calyptera Say.
The hyaline spot is partly or wholly in the bulbous part..*philadelphica* Macquart.
7. No hyaline spot in the marginal cell.....*capucina* Fabricius.
A hyaline spot in the marginal cell.....*fascipennis* Say.
8. Antennal style longer than width of third antennal segment.....10.
Antennal style shorter than width of third antennal segment.....9.
9. The apical brown cross-band extends into the third posterior cell.
eremita Osten Sacken.
The apical brown cross-band does not cross the second posterior cell.
sima Osten Sacken.
10. Veins at base of third posterior cell broadly brown.....11.
No brown surrounding these veins.....*grata* Coquillett.
11. The brown spot at the base of the third posterior cell is at most obscurely connected with the apical fascia.....12.

The brown spot is connected with the fascia in almost its full width.
pueblensis Jænnicke.

12. Pleura with only white or yellow pile above ..... 13.
Pleura largely black-haired above ..... *iota* Osten Sacken.
13. Legs black, the anterior tibiæ rarely red ..... *pueblensis* Jænnicke.
Femora and basal half or more of the tibiæ, reddish ..... *doris* Osten Sacken.

Exoprosopa clarki, new species

Related to *filia* Osten Sacken but with longer proboscis and a deep brown cloud at the base of the fourth posterior cell. Length, 14.5 mm.

MALE.—Face, cheeks, and lower three-fifths of the front yellowish red in ground color, the scales golden yellow, less abundant on the upper half of the front, a few scattered black ones on the lower half of the front. Hair on face and front black, on the cheeks yellow, the occiput behind with short, erect white hair, along the orbits with dense, fine white scales. Antennæ black, the basal segment reddish; third segment elongate conical, the style three-fifths as long as the segment. Proboscis projecting more than the length of the head beyond the oral margin.

Thorax black, the pleura gray pollinose; posterior calli and scutellum brownish red. Pleura and anterior fourth of the mesonotum with long, bright yellow pile; sides of the mesonotum behind the notopleura and the upper, posterior part of the mesopleura white-haired. Mesonotum with scale-like shining black tomentum; along the dorso-central lines with a stripe of yellow tomentum, the posterior border broadly yellow-haired. Scutellum with black scales on basal half and yellow apically, the hair black on the disc, yellow on the sides and apical border; about twelve black marginal bristles.

Legs reddish; tarsi black; anterior four femora and tibiæ with black scales in front; the posterior ones with only a few black scales; anterior tibiæ with spicules.

Wings cinereous hyaline, brown in front of the fourth vein to beyond the anterior cross-vein, thence obliquely to the costa beyond the end of the first vein; the base of the wings broadly on their full width, a large cloud surrounding the vein at the base of the fourth posterior cell, and a much smaller cloud at the base of the third posterior cell also brown; a pale yellow-brown infuscation covers the basal half of the second basal cell and the basal fifth of the anal cell. Squamæ reddish yellow with somewhat paler fringe. Halteres reddish yellow.

Abdomen black, the sides broadly, apices of the segments and broad apex of the abdomen reddish; the venter wholly reddish. Scale-like tomentum black, the second and fourth segments each with a very broad white anterior fascia, the seventh wholly white. Second segment with a narrow orange fascia anteriorly which widens toward the lateral margins, sixth orange on the apical half with only scattered black scales in the middle, the fifth with the apical half orange on the lateral fourth. Base of the abdomen broadly,the broad base of each segment except medianly, and the whole of the seventh segment with yellow or tawny hair, the hair on the dorsum, however, appearing mostly black, the lateral margins with dense hair which is yellowish on the first three segments and more tawny on the narrow bases of the following three, the posterior half or more of the third to fifth segments with black hair. The venter bears tawny hair and scales, the latter with paler ones intermixed.

HOLOTYPE.—Male, Mud Springs, Santa Catalina Mts., Arizona, about 6500 ft., August 19, 1916, (F. E. Lutz).

Named in honor of Mr. B. Preston Clark, under whose auspices the expedition to Arizona was undertaken.

Exoprosopa lutzi, new species

Related to *rostrifera* Jænnicke but with no trace of a brown cloud at the base of the fourth posterior cell. Length 14 mm.

MALE.—Head black, the oral border reddish or reddish yellow, the whole thinly gray pollinose and appearing slate-colored; lower half of the front, the sides above, and the face wholly, with yellow scales. Pile pale yellow, black on the front and middle of the face. Front of moderate width, the sides but little converging on the upper half. Occiput with white, scale-like tomentum; ocellar triangle reddish. Basal two antennal segments reddish, the third conical, the style about one-third longer than the third segment. Proboscis projecting more than half its length beyond the oral margin.

Pile of thorax reddish yellow; paler yellow on the sides above the wings, the hair of the dorsum black, the prescutellar area with some long, hair-like tomentum. Mesonotum clothed with black, scale-like tomentum which is divided by three broad, pale vittæ, the median one not strongly marked. Scutellum brownish red, with the broad base and sides black; tomentum mostly black, pale on the border, the hair black and sparse; five or six black bristles on either side.

Legs reddish, with numerous black scales; apices of the tarsal segments, apical segment of the anterior four, and apical four of the anterior pair, black or brown; anterior tibiæ with spicules.

The brown wing-pattern extends from about the basal third of the second basal cell to the apex of the first vein and also covers the basal sixth of the anal cell. Squamæ rusty yellow, the fringe yellow. Halteres reddish, the basal half of the knob brownish.

Abdomen black, the sides broadly reddish; apices of segments reddish; with black, scale-like tomentum, the apices of the segments with yellow scales; second segment with a broad band of white, the seventh wholly white; the abdomen is a little rubbed and there may be much more extensive yellow scaling toward the sides. Sides of abdomen denuded except at the base where the pile is pale yellow; all the dorsal hairs are black except on the basal segments. Venter reddish, with yellowish hair, the scale-like tomentum mostly black.

HOLOTYPE.—Male, Sycamore Canyon, Santa Catalina Mts., Arizona, August 20, 1916, (F. E. Lutz).

Exoprosopa dodrina, new species

Related to *rostrifera* Jænnicke but with a small brown spot at the base of the third posterior cell, the face mostly reddish, the postocular tomentum whitish, etc. Length, 12 to 14 mm.

MALE.—Head black; face and cheeks reddish, the former usually with a large blackish spot in the middle, the reddish color sometimes covering the lowest fifth of the front. Pollen of the front brown, of the occiput gray. Lower half of front and the face densely golden-yellow scaled, the scales extending along the sides of the front almost to the ocelli; hair of front and middle of face black, on the sides of the face golden yellow; occiput with whitish pile and with whitish tomentum along the orbits.

Basal two antennal segments reddish; third black, rather short conical, the style about one-half longer than the third segment. Proboscis projecting a little more than half its length beyond the oral margin.

Thorax black; pleura gray pollinose; mesonotum rather brownish tinged, black tomentose, with three pale tomentose vittæ, the median one broad. Pile reddish yellow or pale tawny, pale yellow above the wings, the erect dorsal hairs black. Scutellum brownish red, the base black; hair black; tomentum black, the broad border with golden-yellow tomentum; about ten marginal bristles.

Legs reddish; apical tarsal segment and sometimes most of the front tarsi, brown or black; femora usually with some scattered black scales. Anterior tibiæ with spicules.

The brown color fills the basal third of the anal cell and extends obliquely to a little beyond the apex of the first vein; base of third posterior cell with small, of fourth posterior with large brown cloud. Squamæ reddish yellow, with paler fringe. Halteres brownish red, with yellow apex to the knob.

Abdomen black, the sides of the second and third segments and the apices of the segments reddish; second and fourth segments with broad white bands, the seventh wholly white, the third basally white on the sides except posteriorly; very broad apices of each segment, (apical third or more) tawny, the space in front black tomentose. Lateral pile reddish yellow, the apices of the segments with black hairs sometimes predominating, the dorsal hair black except on base of abdomen and the seventh segment. Venter pale orange, the pile of the same color, the tomentum white, yellow on the fifth and sixth segments.

FEMALE.—Similar to the male but with a wider front.

TYPES.—Three males and four females, Boulder, Colorado, about 5500 ft., August 7–12, 1919, (F. E. Lutz), and one female, southern Arizona, August, 1902, (F. H. Snow). The holotype, male, and allotype, female, are from Boulder.

Exoprosopa pardus Osten Sacken

OSTEN SACKEN, 1886, 'Biol.-Centr. Amer.,' Dipt. I, p. 88 (f.).

?Exoprosopa brevistylata WILLISTON, 1901, 'Biol.-Centr. Amer.,' Dipt., I, p. 272.

A single male, Sabino Basin, Santa Catalina Mts., Arizona, (F. E. Lutz).

This specimen agrees with both the descriptions given above and it seems likely that both names apply to the same species. I have seen no specimens agreeing with the descriptions from Mexico and it is possible that my identification is wrong. The types of *pardus* and *brevistylata* are in the British Museum and the question of their relationship can be easily settled.

Exoprosopa texana, new species

Related to *titubans* Osten Sacken but the antennal style is hardly as long as the width of the third antennal segment. Length, about 14 mm.

MALE.—Head black, the cheeks and oral border yellow; front and face with yellowish scales; hair of front black, of the face pale yellow; occipital pile whitish;

postocular tomentum white. A patch of black hair at the anterior oral margin. Antennæ wholly black; third segment elongate conical; style very short, not as long as width of third antennal segment. Proboscis scarcely projecting beyond the oral margin.

Thorax black; pleura gray pollinose; the pile pale yellow, reddish yellow above on the anterior half of the mesonotum, whitish above the wings. Mesonotum with black tomentum and three entire, broad yellow tomentose vittæ, the median one widest and increasing in width posteriorly. Scutellum brownish red, the base broadly black; tomentum yellow, only the median third at the base black-scaled; hair black except at the sides; about fourteen black marginal bristles.

Legs black; anterior tibiæ without spicules.

Wings cinereous hyaline, brown in front of the fourth vein to a little beyond the anterior cross-vein, thence in front of the second vein to beyond the middle of the basal submarginal cell, the base of the wing brown. A cloud at the base of the fourth posterior cell and sometimes a faint small one at the base of the third posterior. Squamæ pale yellow, with yellow border and fringe. Halteres reddish, with yellow knob.

Abdomen black, the sides of the second to fourth segments reddish. Scale-like tomentum mostly pale, the apices of the segments black-scaled, the dark bands widest on the anterior segments; second, fourth, sixth, and seventh segments white, the white bordered with dull orange posteriorly, the third and fifth dull orange or ochreous. Sides of the abdomen with white hair, the segments with coarse black hair predominating posteriorly; seventh segment yellow-haired. Venter reddish except basally; white tomentose and yellow-haired, the fifth segment dull ochreous with some black scales medianly.

TYPES.—Holotype, male, and two male paratypes, Marathon, Texas, July 1–2, 1916, (F. E. Lutz).

Paratype in Philadelphia Academy of Natural Sciences.

Exoprosopa mus, new species

Related to *titubans* Osten Sacken but the erect hairs in front of the scutellum are black and the apical fringes of all but the last abdominal segment are black. Length, 13 to 14 mm.

MALE.—Head black, the cheeks and oral margin yellow; tomentum of front and face pale brassy yellow; pile of front black, of face yellow, a tuft of black hair at the anterior oral margin. Occiput with whitish tomentum and pile. Antennæ black; third segment conical; style about as long as the third segment. Proboscis projecting the length of the labellæ beyond the oral margin.

Thorax black, pleura gray pollinose, white pilose; mesopleura, sides of mesonotum in front and the collar reddish yellow, bordered behind with white which continues along the lateral margins above the wings. Mesonotum reddish brown tomentose, broadly white in front of the scutellum, the erect hairs black. Scutellum rusty reddish, reddish brown tomentose, the border white, a few black scales at the base in the middle; hair black; eight or ten marginal bristles.

Wings cinereous hyaline; costal and sub-costal cells and first basal cell brown, only a trace of a cloud at the base of the fourth posterior cell. Squamæ brownish yellow, with bright reddish-yellow fringe. Halteres brownish red or brownish with paler knob.

Abdomen black, the sides of the second to fourth segments reddish. Tomentum whitish, the second to sixth segments with black posterior borders, those on the second and third preceded by a narrow reddish-yellow band; seventh segment somewhat silvery. Pile on base and sides of abdomen yellow, the second to sixth segments with coarse black hairs at the apices. Venter reddish with black base, very densely white tomentose and pilose; in one specimen the ground color black.

TYPES.—Holotype, male, Dos Arroyos, Guerrero, Mexico, 1000 ft., (H. H. Smith); paratypes, male, same data as holotype and male, Tierra Colorada, Guerrero, 2000 ft., (H. H. Smith).

The specimen from Tierra Colorada has the venter black and the brown of the wings is deeper in color but I can see no other differences. The dorsum is largely denuded but what remains of the vestiture agrees with the other two specimens.

Exoprosopa albifrons, new species

Related to *brevirostris* Williston but the face is black and there is a large patch of silvery scales on the lower part of the front. Length, 13.5 to 14 mm.

MALE.—Head black; cheeks and oral margin yellowish. Lower half of front and middle of face with broad silvery-white scales. Front narrow above, black pilose; face with yellowish pile; occipital pile yellowish. The occiput has been wet so that it is not possible to determine the color of the tomentum; what remains appears black but it was, no doubt, originally white. Antennæ black, the first segment reddish below; third segment conical; style a little more than half as long as the third segment. Proboscis not projecting beyond the oral margin.

Thorax black, the pleura grayish pollinose; posterior calli and scutellum brownish red. Pile on front of mesonotum and mesopleura, yellow; whitish on the pleura and above the wings. Mesonotum with black tomentum and with three yellowish tomentose vittæ; black hairs rather numerous on anterior half. Base of scutellum black; tomentum mostly reddish yellow; hair black; about fourteen marginal bristles.

Legs black; femora sometimes reddish in ground color; anterior tibiæ without spicules.

Wings brown in front and basally; second basal cell wholly brown, the dark color extending obliquely from the apex of the anal cell to the apex of the first vein; apical two-thirds of anal cell hyaline. Squamæ, fringe, and halteres reddish yellow.

Abdomen black, the sides of the second and third segments reddish; clothed with black tomentum which is normally overlaid on the second, fourth and seventh segments with tomentose white scales, the apices of the second and fourth segments very broadly black. It is possible that there are bands of yellowish scales on the third and sixth segments since there are scattered scales of this color, although the sixth segment may normally be mostly white-scaled. Hair on base and sides of abdomen pale yellow. Venter black, the apices of the segments reddish yellow; tomentum whitish; pile yellow.

TYPES.—Holotype, male, and two paratypes, Mud Springs, Santa Catalina Mts., Arizona, alt. about 6500 ft., (F. E. Lutz).

Exoprosopa panamensis, new species

Abdomen with six broad pale fasciæ, the anterior four usually rather reddish ochreous, the posterior two white and almost always interrupted. Length, 12.5 to 15 mm.

MALE.—Head black; cheeks brownish. Face and front with intermixed black and golden-yellow tomentum, the pale scales usually predominating; hair black. Occipital pile black, the tomentum pale brassy yellow. Antennæ black, the first segment usually obscure reddish; third segment elongate conical, the style about three-fifths as long as the segment. Proboscis projecting beyond the oral margin for less than the length of the labellæ.

Thorax black; pile on upper part of pleura, sides and front of mesonotum bright tawny; lower part of pleura black-haired. Mesonotum blackish tomentose, with a very large tawny tomentose triangle on the posterior border which reaches obscurely to the front margin, the short, erect black hair fairly abundant. Scutellum reddish brown in ground color, black tomentose, the free border broadly tawny tomentose; hair black; twelve or fourteen marginal bristles.

Legs black; anterior tibiæ without spicules.

Wings with the base and anterior border deep brown; second basal cell wholly brown, the brown color extending obliquely from a little before the apex of the second basal cell to a point a little before the apex of the first vein; about the basal third of the anal cell brown. Squamæ brownish orange, with reddish yellow fringe. Halteres brownish red with reddish yellow knob.

The abdominal segments are black-scaled behind the pale fasciæ and the abdomen bears tawny pile on the sides of the basal three segments. The pale fascia on the second segment is very wide and normally the fasciæ are narrowed toward the middle, although that on the fourth segment usually retains its full width. While the fasciæ on the sixth and seventh segments are usually white, that on the sixth is frequently tinged with ochreous and the same may be true of that on the seventh segment. Venter black, with some pale scales and reddish-yellow hair on the basal three or four sternites.

FEMALE.—Differs only sexually.

TYPES.—Holotype, male, and allotype, female, Fort Randolph, Canal Zone, January 23, 1929, (Curran). Paratypes.—Forty-three specimens of both sexes from Canal Zone: Fort Randolph, January 23, 1929, February 6, 1929; France Field, January 18, 1929; Corozal, January 31, and February 4, 1929; and Patilla Point, January 15, 1929, (Curran).

This species was very common on the Atlantic side of the Isthmus where it occurred along with a species of *Hyperalonia.*

Exoprosopa junta, new species

Related to *brevirostris* Williston but lacking black scales on the face and front and with brown instead of black tomentum on the mesonotum. Length, 14 mm.

FEMALE.—Face and lower half of front reddish; cheeks yellow; front and middle of face black-haired, the sides of the face with yellow hair. Hair and tomentum of the occiput white. Scales of front and face brassy yellow. Antennæ brown, the first segment reddish; third segment elongate conical, the style three-fifths as long as the segment. Proboscis not projecting beyond the oral opening.

Thorax black; pleura in part, posterior calli and scutellum reddish. Pile on front of thorax and mesopleura reddish yellow; on the pleura and above the wings yellowish white. Tomentum of the mesonotum mostly yellowish, but there are apparently two or three rows of brownish scales; hair black except in front of the scutellum.

Legs reddish, black tomentose behind; anterior tibiæ becoming black apically, their tarsi and the apical four segments of the remaining tarsi black; anterior tibiæ without spicules.

The brown of the wings fills out the second basal cell and extends obliquely to a point opposite the end of the sub-costal vein; only about the basal fourth of the anal cell brown. Squamæ and fringe yellowish red. Halteres reddish with pale knob.

Abdomen black, the sides broadly reddish; evidently clothed with yellowish scales, the apices of the second to fourth segments black-scaled except laterally, all the segments with reddish apices. Pile on the sides and base of the abdomen yellowish; there appear to be some scale-like black hairs at the apices of the intermediate segments. The abdomen is too much denuded to be certain of the arrangement of the vestiture, but it is certain that the scales do not lie above black tomentum. Venter reddish with whitish tomentum and yellow hair, the apical three sternites with transverse, black basal triangles.

HOLOTYPE.—Female, La Junta, Colorado, about 4100 ft., August 12, 1920, (F. E. Lutz).

The wing pattern in this species and *brevirostris* Williston is very similar and is fuller than in allied species. However, the two are very different. The hair on the scutellum of *brevirostris* is long and erect while in *junta* it is short and appressed; *brevirostris* has black scales basally on the terminal abdominal segments, while these are quite absent in *junta*.

ASILIDÆ

Cophura pollinosa, new species

In Melander's key (Psyche, XXX, p. 208, 1923), traces to couplet four where it disagrees with both alternatives. The abdomen is pollinose with the exception of the apex which is shining black, a character not found in any other described species. Length, 9 to 10 mm.

MALE.—Head white pollinose, the front tinged with yellow; hair and bristles white; fine scattered hairs on the sides of the face; palpi and antennæ brown, the latter thinly cinereous pollinose; style as long as second antennal segment.

Thorax gray pollinose; mesonotum with a broad, geminate, posteriorly abbreviated median vitta and two spots on either side brown or blackish brown; bristles white, those on the notopleura brown; no pile except on the prothorax; scutellum with a bristle and a bristly hair on either side.

Legs shining black, the coxæ pale pollinose; hair and bristles white; anterior tibiæ on basal half, middle pair on basal two-thirds, and posterior pair on basal three-fourths, reddish yellow. Middle tibiæ with the usual two short, obtuse black spines at apex of the ventral surface.

Wings cinereous hyaline or with a brownish-yellow tinge; anal cell open. Squamæ with short white fringe. Halteres yellow.

Abdomen with almost parallel sides on basal three-fifths, tapering apically; covered dorsally with brown pollen which is thinner on the apical segment and genitalia, the sides broadly and the broad apices of the segments grayish pollinose; venter with gray pollen. Pile short and black dorsally, white on the sides and venter.

FEMALE.—Seventh segment and genitalia polished black, the sixth segment often largely polished black dorsally.

TYPES.—Holotype, male, Kits Peak Rincon, Baboquivari Mts., Arizona, August 1–4, 1916, alt. about 4050 ft.; allotype, female, Coyote Mts., Arizona, August 4–7, 1916, alt. about 3500 ft.; paratypes, two males and four females, same localities, August 1 to 10, 1916.

Paratypes in the Philadelphia Academy of Sciences.

CEROTAINIOPS, new genus

In many respects intermediate between *Cerotainia* Schiner and *Atomosia* Macquart but at once distinguished from both genera by the shape of the third antennal segment which is rather short, narrowly pyriform and obtusely rounded apically. The abdomen is robust and almost bare as in *Atomosia* and the wing venation is similar. In Hermann's key to the genera of the Atomosinæ (Nova Acta, XCVI, pp. 28–33, 1912) the genotype traces to the following genera, depending upon the category in which it is placed according to shape of head: (1) if the head is considered to be more than twice as wide as high traces to *Amathomyia* Hermann, but the shape of the antennæ and presence of five posterior cells at once distinguish it from this genus; (2) if the head is considered as not more than twice as wide as high, traces to *Cenochromyia* Hermann, but the shape of the antennæ at once throws it out of this genus. In Williston's 'Manual,' 1908, traces to couplet 6 of the Laphrinæ, where it differs from *Cerotainia* in having the first antennal segment but little longer than the second and from *Atomosia* by the short third segment and the widening of the front toward the vertex. The genus further differs from both of these by having the lateral slopes of the metanotum bare. The marginal cell is long petiolate.

GENOTYPE.—*Cerotainiops rufiventris*, new species.

Cerotainiops rufiventris, new species

Figure 1

Brown in ground color, the abdomen brownish red; wings with brownish yellow cloud on apical half. Length, 13 to 14 mm.

FEMALE.—Head densely whitish pollinose, the hair and bristles wholly white; face slightly convex, a little more produced at the oral margin than at the base of the antennæ, about as long as wide, wholly covered with fairly long, sub-appressed hair; the bristles of the mystax are rather fine, either yellow or black, and limited to a double row close to the oral margin. Mouthparts shining black. Antennæ brown, the basal segments with more or less reddish tinge at the ends, the apical two segments thinly pollinose.

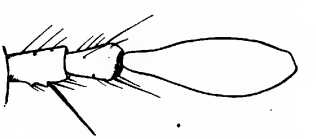

Fig. 1. Antenna of *Cerotainiops rufiventris*, new species.

Pleura, except a large spot in front of the middle coxæ and a small spot above the posterior coxæ, yellowish-white pollinose, the broad sides and posterior border of the mesonotum and the scutellum, except its free border, with similar pollen; a narrow line of pale

pollen extends inward along the suture and is connected at its inner end by a slender longitudinal vitta with a wider band extending inward from behind the humeri; the humeri have a large bare spot on their outer edge. The thorax lacks bristles except on the sides and bears short, sparse whitish pile which is very fine on the pleura and appressed; on the mesonotum it is coarser and a little longer in addition to being appressed. The scutellum bears at the apex a border of short, erect hairs which extend but little above its upper surface; the disc bears short, erect hairs.

Legs castaneous or black; if castaneous, the femora largely and the tarsi somewhat darker; if black, the tibiæ paler on the broad bases; coxæ whitish pollinose. Bristles and hair of legs white.

Wings cinereous hyaline with brownish-yellow cloud on the apical half, the apical third grayish anteriorly, the posterior border with faint whitish tinge in some lights. Squamæ yellowish with very short fringe. Halteres reddish yellow.

Abdomen brownish red, convex, very slightly increasing in width from the base to the base of the sixth segment; pile short, sparse, appressed, whitish, on the sides and apex more abundant and in some views appearing whitish with yellow tinge. Ovipositor without spines.

TYPES.—Holotype, female, and paratype, female, Coyote Mts., Arizona, August 4–7, 1916, about 3500 alt.

Paratype in the Philadelphia Academy of Sciences.

MALLOPHORA Macquart

TABLE OF SPECIES

1. Abdomen not wholly black-haired....2.
   Abdomen wholly black-haired (Minnesota, Florida)....*nigra* Williston.
2. Apical abdominal segments wholly black-haired, contrasting with the pale-haired basal segments....3.
   Apical segments largely or wholly pale-haired....8.
3. Scutellum and abdomen with yellow hair....4.
   Scutellum and abdomen with reddish hair (Arizona)....*fulva* Banks.
4. Basal four abdominal segments pale pilose....5.
   Basal two or three segments pale pilose....6.
5. Venter black pilose (U. S.)....*orcina* Wiedemann.
   Venter yellow pilose (Cuba)....*macquarti* Rondani.
6. First and second segments with bands of whitish pile (Cuba)....*bruneri* Bromley.
   First three abdominal segments yellow pilose....7.
7. Arista about equal in length to third antennal segment; male genitalia black-haired (S. E. States)....*rex* Bromley.
   Arista twice as long as third antennal segment; male genitalia yellow-haired (Mississippi, Georgia)....*chrysomela* Bromley.
8. Basal three and apical two abdominal segments white-haired, the intermediate segments black-haired....14.
   All the abdominal segments with pale hair dorsally....9.
9. Propleura entirely yellow-haired....10.
   Propleura with only a few scattered yellow hairs amidst black or brown pile. *fautrix* Osten Sacken.

10. Mesonotum black-haired behind the suture.....11.
    Mesonotum with conspicuous yellow hair behind the suture, especially at the sides.....12.
11. Posterior tibiæ of male yellow-haired on basal half of inner ventral surface (California).....*fautricoides*, n. sp.
    Posterior tibiæ wholly black-haired in both sexes (Texas)....*bromleyi*, n. sp.
12. Femora broadly reddish basally (widespread).....*guildiana* Williston.
    Femora black, the apices may be reddish.....13.
13. Posterior tibiæ black-haired dorsally on whole length (Kentucky to Florida). *laphroides* Wiedemann.
    Posterior tibiæ yellow-haired on basal half (widespread)..*clausicella* Macquart.
14. Mesonotum black-haired; large species, over 20 mm. in length (Georgia, Florida).....*bomboides* Wiedemann.
    Mesonotum mostly yellow-haired; small species, under 12 mm. in length (Kentucky to Florida).....*laphroides* Wiedemann.

Mallophora fautricoides, new species

Related to *fautrix* Osten Sacken but the pleura pale-haired except for scattered black hairs on the median portion and mesopleura. Length, about 18 mm.

MALE.—Head black; lower half of face, basal two antennal segments and the arista, reddish. Pile yellowish white, a few black hairs on the sides of the face below; palpal pile whitish.

Thorax blackish with brownish pollen, the lateral margins of the mesonotum reddish in ground color. Pile of mesonotum black; an anterior band and a broad median vitta on the anterior half and the sides before the suture, short, whitish haired; pile of prothorax and hypopleura whitish. Scutellum with yellowish white pile.

Legs castaneous, black-haired; coxæ and the ventral surface of the posterior tibiæ on the basal half, whitish pilose.

Wings light brown. Squamæ brown, with brown fringe, the upper lobe with white fringe. Halteres brownish red.

Abdomen clothed with pale yellowish hair above and below.

HOLOTYPE.—Male, San Diego, California, August 4, 1917, (W. S. Wright).

The color of the pale pile in this species is much lighter than in *fautrix*. The basal segment of the posterior tarsus is less swollen, etc.

Mallophora bromleyi, new species

Allied to *fautrix* Osten Sacken but at once distinguished by the yellow pilose propleura. Length, 14 to 18 mm.

MALE.—Head black, yellow pilose, a few black hairs on the sides of the front; lower half of face reddish brown to brownish red; basal two antennal segments and the arista reddish.

Thorax dull black; thinly brownish pollinose; mesonotum black-haired except a narrow band of short yellow hair in front, a weak, broad median vitta on the anterior half and a few scattered hairs laterally; pleura with dense yellow pile in front and behind and with scattered yellow hairs mixed with the black on the intermediate portion. Scutellum yellow pilose.

Legs castaneous, black-haired except a few yellow hairs on the apical two segments of the posterior tarsi, the bases of the femora and the coxæ.

Wings pale brownish. Squamæ brown with brown fringe, the upper lobe with yellow fringe. Halteres reddish brown.

Abdomen wholly clothed with yellow pile.

TYPES.—Holotype, male, allotype, female, and one male and two female paratypes, Marathon, Texas, July 1–2, 1916.

Types in American Museum of Natural History; paratypes in Philadelphia Academy of Sciences.

SYRPHIDÆ

Syrphus catalina, new species

Related to *laxa* Osten Sacken but the lower fourth of the front is reddish yellow and the legs are much less black. Eyes pilose; second and third reddish yellow abdominal bands entire; third vein moderately curved into the apical cell. Length, 12 to 13.5 mm.

FEMALE.—Face, cheeks, and lower fourth of the front reddish yellow, the face with a rather narrow median brown vitta on the lower half; face concave above, retreating below the tubercle. Front bronze-black, very widely yellow pollinose laterally on more than the lower half, the pollen forming an entire band across the middle, the ground color beneath it reddish toward the orbits. Pile of front and middle of face black, elsewhere yellowish white. Arista brown, the third segment large, oval; arista reddish on basal third. Pile of the eyes short and whitish.

Mesonotum æneous, with three weak, gray pollinose vittæ on the anterior half; the lateral margins diffusely reddish. Pile very pale yellowish, yellow laterally. Scutellum yellow, translucent, the apical half with black hair. Pleura greenish black, thinly pale pollinose; with a broad arch of yellow extending over the mesopleura, sternopleura, and to beneath the squamæ, the pale color largely concealed by whitish pollen.

Legs reddish yellow; coxæ and bases of femora brown, the posterior femora sometimes brown on the basal half; posterior tibiæ sometimes with a narrow median brown ring; fourth and fifth segments of the tarsi and sometimes the third on the apical half or more, brownish. Hair black, the anterior four tibiæ and tarsi wholly yellowish haired.

Wings cinereous hyaline, with brownish tinge anteriorly and apically. Stigma pale brownish. Squamæ whitish, with yellow border and fringe. Halteres reddish yellow.

Abdomen black, with four or five dull orange fasciæ, that on the second segment interrupted in the middle and with the inner border of the spots convex, the anterior border touching the anterior margin broadly at the sides; band on third and fourth segments very narrowly separated from base of segments, deeply emarginate in the middle behind and narrowed at the sides posteriorly; fourth segment broadly reddish apically; fifth reddish with a gently arched, incomplete, shining black fascia. Abdomen rather dull, with the first segment, lateral margins and apices of the second to fourth segments shining. Black areas black pilose, the first segment wholly, basal half of the second, the broad reddish fasciæ and more or less of the fifth segment,

yellow pilose. Reddish bands broader than the black fasciæ. Venter reddish with entire, medianly broadened black fasciæ.

TYPES.—Holotype, female, and three paratypes, Bear Wallow, Santa Catalina Mts., Arizona, July 12 to 17, 1916, (F. E. Lutz).

Paratypes in the Philadelphia Academy of Sciences.

Callostigma hyalipennis, new species

Differs from *elnora* Shannon in lacking a brown spot at the apex of the wing, wholly yellow scutellum, etc. Length, 5.75 mm.

FEMALE.—Face yellow, perpendicular, strongly receding below the tubercle; pile yellow. Front pale orange, the upper fourth, a median vitta and a small lunular spot shining black, the vitta becoming ferruginous on its anterior third; pile black, yellow on the sides of the lower half. Ocellar triangle slightly shorter than wide. Occiput black, densely cinereous pollinose, vertex more yellowish; pile pale yellowish, short. Antennæ reddish yellow; third segment a little longer than wide, rounded apically, the arista brown, about as long as antenna.

Thorax yellow, the median three-fifths of the mesonotum bronze-black, outside the grayish-yellow pollinose vittæ with strong purplish reflections; median pollinose vitta narrow, not reaching the scutellum, the outer ones shorter, wider and gently diverging posteriorly. A broad, shining black band extends from the metanotum to the mesosternum. Pile yellow, black on the apex of the scutellum which is pale orange dorsally.

Legs yellow, the tarsi and a broad, preapical band on the posterior femora more reddish.

Wings cinereous hyaline; stigma luteous. Apical cross-vein straight, transverse, with long appendage at its posterior end; posterior cross-vein practically straight, oblique, with long appendage behind. Squamæ reddish yellow, the upper lobe with pale brown border. Halteres pale orange.

Abdomen orange with blackish markings First segment yellow with a broad, brown posterior fascia which is narrowed medianly and does not reach the lateral margins. Second segment with the posterior fifth black and with a sub-basal brown fascia which is narrowed on either side of the middle and narrowly separated from the lateral margins. Third segment with the posterior sixth black, the black expanded laterally and with an anteriorly produced spur, in the middle in front with an elongate black spot, the remnant of the median vitta. Fourth segment on either side with a sub-triangular black spot which reaches almost to the base of the segment, its inner edge straight, a narrow median vitta and a posterior black fascia which is broadly separated from the black lateral spots. Fifth segment with three black vittæ the outer ones expanding posteriorly to reach the lateral margins broadly; sixth segment wholly black. Pile short, appressed, sparse and black, yellow on lateral margins and first segment.

HOLOTYPE.—Female, Tegucigalpa, Honduras, March 30, 1917, (F. J. Dyer).

Lycastrirhyncha mexicana, new species

Differs from *nitens* Bigot in having four linear vittæ on the central part of the mesonotum. Length, including snout, about 9 mm.

FEMALE.—Head black, the apical half of the snout blue-black; head with yellowish-gray pollen, that on the apical half of the snout and the front thin, the basal part of the snout on the upper surface and a large spot on the front of the cheeks, bare. Pile whitish, the occipital cilia and frontal pile black. Front across the middle with three triangular, opaque-black spots, the median one elongate and reaching nearly to the base of the antennal prominence; a shining black spot extends from each outer ocellus to the posterior corners of the eyes and there is a small opaque-black spot behind each of the posterior ocelli. Antennæ reddish.

Thorax metallic bluish or greenish black, with thin gray pollen, the mesonotum with six black vittæ, the two outer ones of the median four united posteriorly, the outer ones geminate, united in front, broadly interrupted at the suture. Posterior calli dull brown. Scutellum with a large reddish spot on the disc, opaque brown between this spot and the basal corners, the base shining. Pile pale yellowish, with scattered black hairs on the posterior calli and scutellum.

Legs blackish, apices of femora reddish; basal third or less of the tibiæ and the basal segment of the anterior tarsi reddish yellow.

Wings hyaline; veins brown. Squamæ white. Halteres yellow.

Abdomen shining black, slightly bronzed, with opaque black and orange markings. First segment with a small opaque-black spot toward either side; second with a large, rectangular opaque-black spot in the middle extending from the base to the apical third and sometimes produced to unite with a roundish opaque-black spot at the posterior lateral third, the lateral margins broadly shining black, the intervening space orange. Third segment with small, obscure reddish spot on either side at the base, in the middle basally with an oval opaque-black spot and posteriorly, toward the side with a small round spot of the same color. Fourth segment with an opaque-black basal triangle and larger, roundish spots posteriorly. Fifth segment with a small opaque triangle at the base in the middle. Pile very short, pale yellowish.

TYPES.—Holotype, female, Vera Cruz, Mexico, April, (H. H. Smith); paratype, female, Vera Cruz. Both specimens are from the Williston Collection.

These specimens were evidently before Williston when he wrote his description of *nitens* Bigot for the 'Biologia,' although in the description he states that the femora are reddish basally and he makes no mention of the red spot on the scutellum and mentions only an opaque-black spot on the sides of the front; in one specimen the median spot is only faintly indicated; in the same specimen the anterior section of the outer opaque-black vitta on the mesonotum is solid black. There are so many discrepancies between these specimens and the description given by Bigot that they must be referred to a different species. A key to the species will be included in a paper to be published later.